SECTION 32 92 25

SYNTHETIC TURF
09/09

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 1335	(2005) Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings
ASTM D 2265	(2006) Standard Test Method for Dropping Point of Lubricating Grease Over Wide Temperature Range
ASTM D 2859	(2006) Ignition Characteristics of Finished Textile Floor Covering Materials
ASTM D 4355	(2007) Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D 4491	(1999a; R 2004e1) Water Permeability of Geotextiles by Permittivity
ASTM D 4533	(2004) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(2008) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(2004) Determining Apparent Opening Size of a Geotextile
ASTM D 4833	(2007) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D 5034	(2009) Breaking Strength and Elongation of Textile Fabrics (Grab Test)
ASTM D 5848	(2007) Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings
ASTM D 6241	(2009) Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

ASTM F 1015	(2003) Relative Abrasiveness of Synthetic Turf Playing Surfaces
ASTM F 1551	(2009) Standard Test Methods for Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials
ASTM F 1939	(2007 e1) Standard Specification for Shock-Absorbing Properties of North American Football Field Playing Systems as Measured in the Field
ASTM F 2117	(2001) Standard Test Method for Vertical Rebound Characteristics of Sports Surface/Ball Systems; Acoustical Measurement
ASTM F 2157	(2009) Standard Specification for Synthetic Surfaced Running Tracks

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00.00 50 SUBMITTAL PROCEDURES:

SD-03 Product Data

Supplier List
PVC (Polyvinyl Chloride)Drainage Pipe
Geotextile fabric
Warranty

SD-04 Samples

Synthetic Turf

SD-05 Design Data

Aggregate base course sieve analysis
Aggregate finish course sieve analysis

SD-06 Test Reports

Geotextile fabric

SD-07 Certificates

Aggregate Material Certificates

Aggregate supplier must certify that all material delivered to site meets requirements as specified herein.

1.1 GENERAL

The following specifications pertain to the physical training synthetic turf surface as shown and detailed on CG102 and shall be regarded as minimum standards for design and construction. The synthetic surface shall be manufactured / provided by General Sports Venue or approved equivalent. Any variations shall be approved by General Sports Venue, Engineer of Record, and/or the project COR prior to execution.

1.4 WARRANTY

The manufacturer shall provide a warranty against defects in material and workmanship for a period of no less than ten years.

PART 2 PRODUCTS

2.1 SYNTHETIC TURF

The contractor shall provide 18,500 net square feet of low maintenance synthetic turf surface per physical training pit (PT Pit), comparable to a 2" extruded monofilament synthetic turf surface with sand/rubber infill or an approved equivalent. See Article 3.7, MINIMUM REQUIREMENTS, for all minimum requirements.

2.2 AGGREGATE FINISH COURSE

The aggregate finish course shall compile with all sections shown on sheet CG102. The minimum top section shall consist of 1 to 1-1/2 inches of No. 10 screens rolled into the aggregate base section as shown on sheet CG102. The final surface shall be smooth and reasonably safeguarded from all sharp edges from the aggregate base section.

2.3 AGGREGATE BASE COURSE

The aggregate base course shall compile with all sections shown on sheet CG102. The minimum drainage section shall hall consist of a minimum of 2 inches of VDOT No. 21 stone & 6 inches of VDOT No. 57 stone (from top to bottom) and placed over a woven geotextile fabric. The base course section shall be placed and compacted in a uniform manner as not to diminish the typical 40% void ratio produced by the above referenced aggregate section. Rounded stone is not permitted for the base course section.

2.4 WOVEN GEOTEXTILE FABRIC UNDERLAYMENT

The Contractor shall provide a woven geotextile underlayment between the compacted sub-grade and the aggregate base course section; see sheet CG102 for additional details. See Article 3.7, MINIMUM REQUIREMENTS, for all minimum geotextile underlayment requirements.

2.5 SUBGRADE

The sub-grade of each PT Pit, if in fill section, shall be compacted to 95% maximum dry density per ASTM D 1567.

2.6 DRAINAGE PIPE

All drainage pipe shall be Polyvinyl Chloride (PVC).

PART 3 EXECUTION

3.1 GENERAL

All activities are to be sequenced properly and completed in a timely fashion. All measures must be taken to ensure a safe jobsite per all applicable guidelines. All existing conditions and/or new work in place within the job limits must be maintained at all times. Any damage to said materials will be the sole responsibility of the site work contractor.

3.2 EXCAVATION

3.2.1 Survey

Solicit the services of a licensed surveyor to establish grade and control points necessary to complete the scope of work. Maintain such markings throughout the duration of the project.

3.2.2 Underground Utilities

Identify and mark all underground utilities prior to commencement or work. Utilize the services of a utility locating company if available.

3.2.3 Laser Grading

As determined necessary by the Contractor, laser guided machinery will be required to achieve the subgrade elevation as indicated on the Contract Documents. Subgrade must be achieved by laser grading to a ½" tolerance over a twenty-five foot continuous span. The subgrade must be compacted to achieve 95% maximum dry density in fill sections only.

3.3 GEOTEXTILE FABRIC

3.3.1 Delivery

Geotextile fabric must be delivered to site in manufacturer's wrapping and must stay wrapped until placement.

3.3.2 Approval

Do not commence installation unless subgrade has been approved by Contractor's Geotechnical Engineer.

3.3.3 Overlapping

Geotextile fabric must be overlapped per the manufacturer's recommendations.

3.3.4 Damage

If geotextile fabric becomes damaged during installation remove, replace and/or patch per manufacturer's recommendations.

3.3.5 Exposure to Elements

Do not leave geotextile fabric exposed to the elements for more than fourteen days. Aggregate is to be placed within that time frame.

3.4 DRAINAGE

3.4.1 Collector Drain

Collector drain is to be 8 inches, or as indicated on the Contract Documents.

Pipe to be installed at 0.5% to allow for drainage. Location of outlet structure must be determined prior to installation. The point closest to the outlet structure will be the low point of the pipe within the excavation perimeter.

The trench for the collector drain must be lined independently with geotextile fabric allowing on overlap from the field.

Free draining stone must be placed and compacted properly around the collector pipe to the elevation of the subgrade.

All connections are to be made with the manufacturer's recommendations.

Damaged piping is not be utilized and will be removed from site.

3.5 AGGREGATE BASE COURSE

Place only approved aggregate to a depth as indicated in the Contract Documents.

Do not drive equipment over geotextile fabric in place.

Do not stockpile material in a central location and move to perimeter. Material shall not be moved more than 50 feet from final location. Failure to do so will result in a separation of the gradations and a general lack of uniformity in the base.

Laser guided machinery will be required to achieve the sub-grade elevation as indicated on the Contract Documents. Laser grade to a ¼" tolerance over a twenty five foot continuous span. A 0.5% slope from centerline of field to nailer must be maintained. The sub-grade must be compacted to achieve 95% of the maximum density as determined by ASTM D 698. Sub-grade must have the required planarity to mirror that of the finish course.

Compaction is to be achieved by using a vibratory roller.

3.6 AGGREGATE FINISH COURSE

Place only approved aggregate to a depth of no more than 1" once compacted.

A broadcast method is preferred for this application.

Compaction is to be achieved by using a vibratory roller. Aggregate shall be wetted during the compaction process. The finished course shall be free of all impressions, roller marks, etc.

Laser grade to achieve the desired elevation to a tolerance of 1/8" over a 25 foot continuous span. Failure to achieve such requirements will result in re-grading the unacceptable areas of the base.

Solicit the services of a licensed surveyor to verify elevations and planarity. Results shall be made available to the artificial turf installer.

Prior to demobilization, Gthe artificial turf installer must approve the finish course. Site contractor may leave no more than ½ yard of finish course aggregate for repairs.

3.7 MINIMUM REQUIREMENTS

3.7.1 Synthetic Turf Minimum Requirements

MATERIALS	IDENTIFICATION
Primary Yarn Polymer	100% Polyethylene
Yarn Cross-Section	Slit Film
Standard Color	Sport Green
UV Stablized	Yes
Fabric Construction	Tufted
Face Primary BAcking	38 oz.
Coating Type	Polyurethane
Primary Yarn Denier	8000
Primary Yarn Polymer	100% PE

FINISH FABRIC	ENGLISH SYSTEM		METRIC SYSTEM		ASTM TEST
NOMINAL SPECIFICATION	*VALUE*	*UNITS*	*VALUE*	*UNITS*	*METHOD*
Fiber Denier	8,000	Denier	8.000	Denier	
Pile Height (minimum)	2.10	inches	54	mm	
Pile Height (maximum)	2.50	inches	63	mm	
Pile Ribbon Face Weight	38	oz/sq. yd.	1,288	g/m2	ASTM D 5848
Fiber Thickness	100	Micron	100	Micron	
Primary Weight Backing	8	oz/sq. yd.	271	g/m2	ASTM D 5848
Secondary Backing Weight	22	oz/sq. yd.	746	g/m2	ASTM D 5848
Total System Weight (w/o infill)	68	oz/sq. yd.	2,305	g/m2	

FINISH FABRIC	ENGLISH SYSTEM		METRIC SYSTEM		ASTM TEST
Tuff Bind	8	lbs.	3.6	kg	ASTM D 1335
Yarn Elongation	50	%	5050	%	ASTM D 2265
Grab Tear Strength	288	lbs./ft.	131	kg	ASTM D 5034
Flammability	PASS		PASS		ASTM D 2859
Relative Abrasiveness	14.45		14.45		ASTM F 1015
Shock Attenuation (G-Max) 3.0 lbs rubber and 1.0 lbs sand over stone base	82	G-MAX	82	G-MAX	ASTM F 1936
Force Reduction	55-70	%			ASTM F 2157
Surface Stability/Vertical Deformation	55-70	%			
Ball Rebound	30 - 50% (Soccer Only)				ASTM F 2117
Carpet Percolation Rate (Lab Tested)	112	inches/hour*			ASTM F 1551
System Drainage	14	inches/per hour*			ASTM F 1551

Note 1: Any change from the specified values is considered a special product that will require confirmation from manufacturing

Note 2: If the customer requires the specified value to be a minimum value, the product target and production cost will be shifted to the maximum of the range.

Note 3: All values are -/+ 5 percent.

3.7.1 Woven Geotextile Underlayment Minimum Requirements

PROPERTY	TEST METHOD	UNITS	ENGLISH
Tensile Strength	ASTM D 4632	lbs (N)	200
Elongation	ASTM D 4632	%	15
Puncture	ASTM D 4833	lbs (N)	90
Trapezoidal Tear	ASTM D 4533	lbs (N)	75
UV Resistance (min)	ASTM D 4355	%	50 at 500 Hrs.

PROPERTY	TEST METHOD	UNITS	ENGLISH
AOS	ASTM D 4751	US Std. Sieve	40
Permittivity	ASTM D 4491	1/sec	0.04
Water Flow Rate	ASTM D 4491	gpm/ft2	4.0
CBR Puncture	ASTM D 6241	lbs (N)	700

-- End of Section --